

Trends and Future Avenues: A Bibliometric Analysis of the 150 Most Cited Papers on Brachial Plexus Blocks, from 1993 to 2023

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Introduction

Bibliometric studies have been used to **identify trends in publications** and help **set research priorities**. These studies have been useful in the characterization of global publications in anesthesiology and within the field of regional anesthesia.

Study Goals

- The objective of this study is to conduct a bibliometric analysis of the 150 most-cited publications on brachial plexus blocks (BPB) from the years 1993 to 2023, in order to:
- 1) Understand existing trends in publication characteristics and content
 - 2) Identify potential avenues for future research

Methods

- **Database:** Articles from 1/1/1993 to 7/1/2023 were screened from the Science Citation Index-Expanded (SCI-Expanded) of the Web of Science Core Collection (WoS)
- **Search terms:** "brachial plexus block", "axillary nerve block", "infraclavicular nerve block", "supraclavicular nerve block", and/or "interscalene nerve block"
- **Inclusion criteria:** full-length journal articles, letters, and reviews limited to anesthesiology
- **Exclusion criteria:** articles with animal models, non-English papers
- Top 150 articles with the most citations were identified from a total of 1140
- Each paper was evaluated to categorize the **content of the paper** and to identify **block type, study type, first author gender, journal, and country** of publication
 - Gender of the first author was identified by utilizing images of authors and/or determining if the first name is commonly known to be male or female
- **Statistical analysis:** Mann-Whitney U and Kruskal-Wallis

Conclusions

- **Adjuvant medications** for BPB was the most popular topic within the top 150 most-cited papers, and thus a strong avenue for future research.
 - Within these papers, **perineural and intravenous dexamethasone** and their ability to increase the duration of analgesia in BPB was most frequently studied
- There is a wide representation of countries in the most cited papers indicating a **global interest in brachial plexus block research**.
- **Female first authors are starkly underrepresented** in the top 150 most-cited papers.
 - Further research is needed to understand the contributory factors for this gender disparity. Addressing these factors can allow for more representation in the field of regional anesthesiology

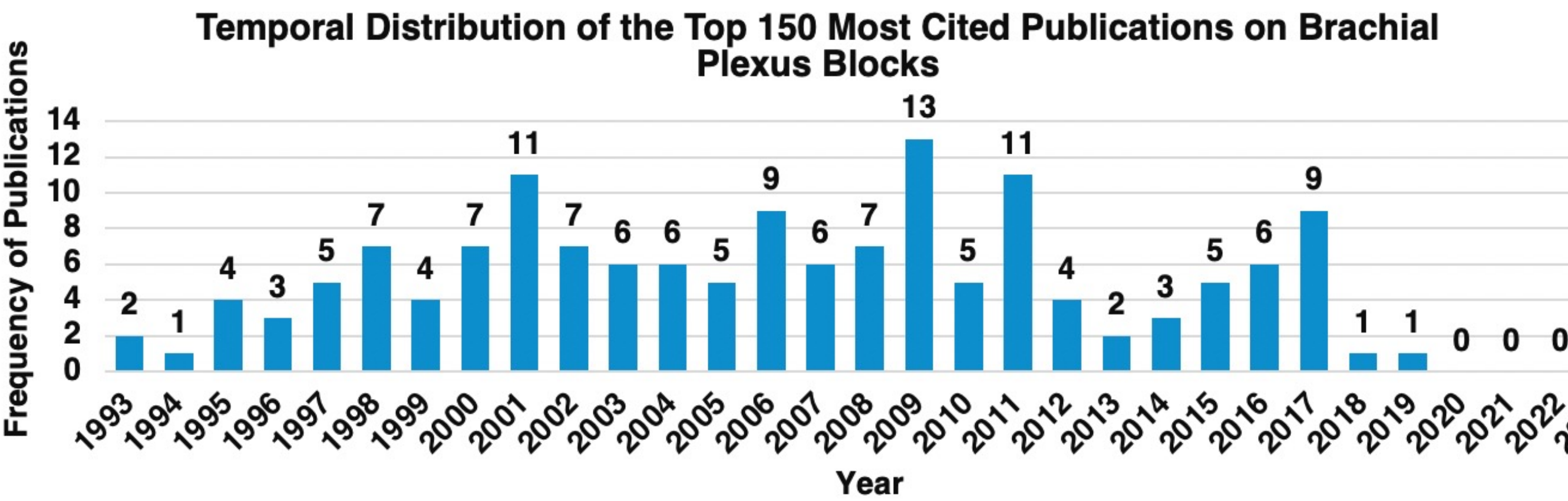
Adjuvant medications for brachial plexus blocks are a strong avenue for future research, given the topic’s popularity.



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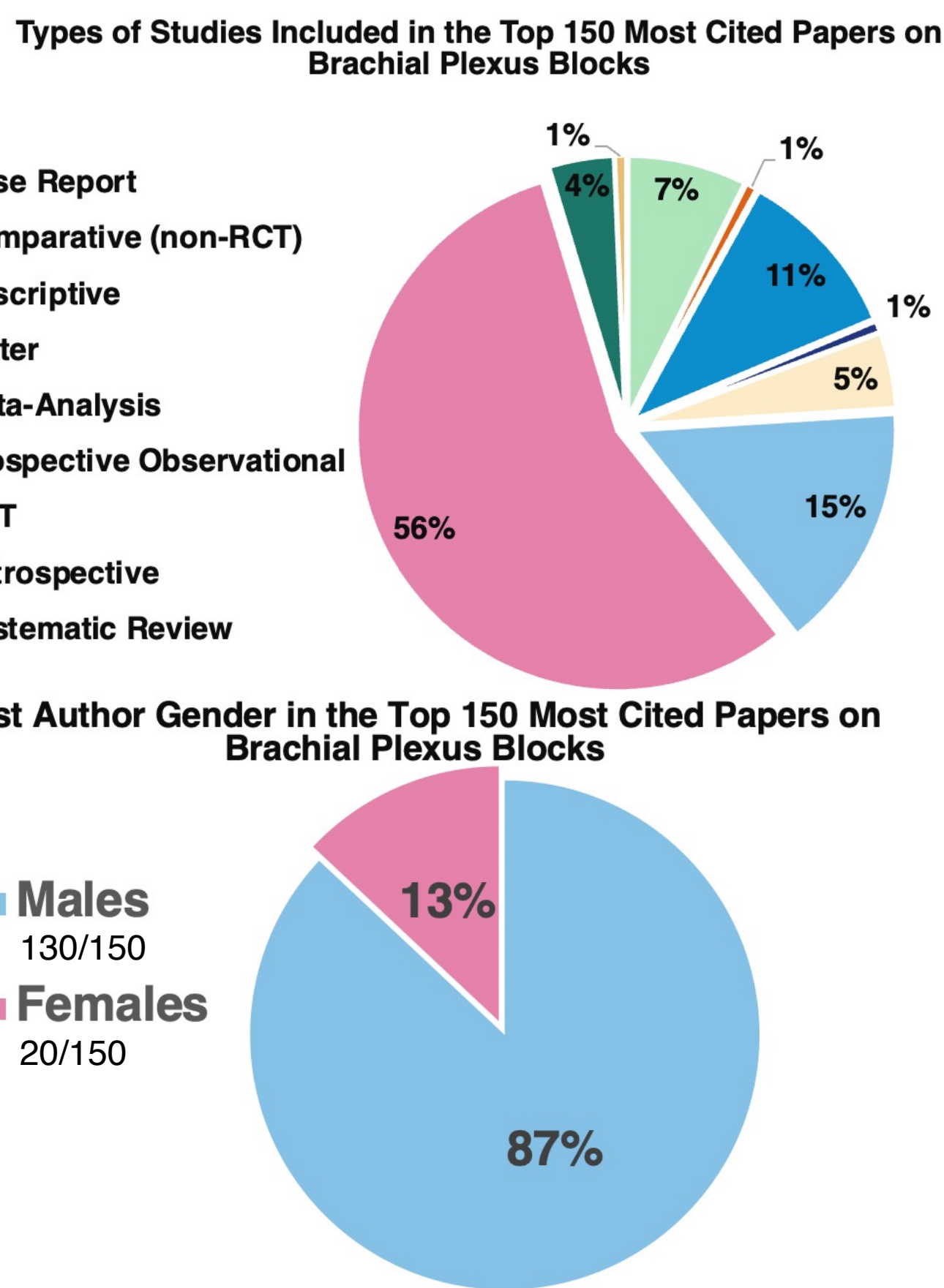
Trends



Type of Block	Count (%)	Mean Average citations per year	Median Average citations per year	Total Citations
Axillary	33 (22)	4.85	3.16	3102
Infraclavicular	19 (13)	4.64	4.04	1580
Supraclavicular	25 (17)	5.33	4.67	2107
Interscalene	51 (34)	6.52	6	5043
Humeral Canal	1 (1)	2.52	2.52	58
Combined Analysis	7 (5)	9.86	10.14	673
Comparison between blocks	14 (9)	6.65	6.305	1045

Category of content	Count (%)	Mean Average citations per year	Median Average citations per year	Total Citations
Addition of adjuvant medication	31 (21)	7.36	5.67	2795
Anatomic Basis	5 (3)	4.112	2.92	385
Anesthetic Type	5 (3)	2.82	2.6	356
Anesthetic Volume	12 (8)	5.94	4.72	948
Clinical efficacy	4 (3)	6.39	2.55	326
Comparison of block types	15 (10)	6.52	5.73	1082
Comparison of block vs. GA	5 (3)	3.85	4.13	453
Complications from block	19 (13)	5.48	3.47	1986
Continuous Infusion	9 (6)	6.05	6.32	967
Nerve stimulation	9 (6)	3.66	2.68	671
Number of blocks	3 (2)	3.38	3.53	174
Physiological effects	1 (1)	2.72	2.72	49
Prevention of complications	1 (1)	2.15	2.15	56
Monitoring during/after block	2 (1)	6.605	6.605	112
Technique	13 (9)	4.9	4.44	1051
Ultrasound Guidance	16 (11)	7.42	7.29	2073

Total citation count: 13,608
Most cited paper at time of analysis: “Acute and nonacute complications associated with interscalene block and shoulder surgery - A prospective study” published in *Anesthesiology* by Borgeat et al. in 2001. (304 citations)



Findings

- 14 unique journals represented, with the top 3 journals with the most-cited studies being:
 - 1) *Anesthesia and Analgesia* (n=43, 29%), 2) *Regional Anesthesia and Pain Medicine* (n=39, 26%), 3) *Anesthesiology* (n=20, 13%)
- 26 distinct countries represented, with the top 3 countries with the most cited studies being:
 - 1) USA (n=50, 33%), 2) Canada (n=32, 21%), and 3) France (n=9, 6%)
- There are significantly higher median average citations per year for studies conducted between 2009 and 2023 than between 1993 and 2008 (6.61 vs. 4.11, p < 0.001).
- Of types of studies, meta-analysis had the highest average citations per year at 12.89 (H(6) = 18.2, p = 0.006).
- The adjuvant medications for BPB that were studied in the top cited papers were dexamethasone (n=12), clonidine (n=5), precedex (n=3), opioids (n=4), buprenorphine (n=2), magnesium (n=2), midazolam (n=1), gabapentin (n=1), and liposomal bupivacaine (n=1)